

---

# ENVIRONMENTAL Fact Sheet

---



29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • [www.des.nh.gov](http://www.des.nh.gov)

---

WD-WSEB-6-1

1998

## Developing a Utility Water Conservation Program

### STATE TRUSTEESHIP

The New Hampshire legislature has adopted policies and statutes which set forth the concept that state government has a trustee responsibility to ensure the wise use of our water resources. Although relatively water rich, New Hampshire still needs to protect and conserve these resources if we are to meet our obligations to both the environment and society in the future.

### UTILITY & CONSUMER RESPONSIBILITIES

This document provides information pertaining to actions that a water utility can take to develop an overall water conservation program. Fact sheet WD-WSEB-6-2 identifies what individual consumers can do to conserve water. The Department of Environmental Services (DES) urges public water systems to develop a balanced water conservation program that both prevents waste and also makes wise and beneficial use of the water resources so richly bestowed on New Hampshire. This document is intended as a very basic introduction to the topic of water conservation. Other references are given at the end of this document.

### DEVELOPING THE GOALS OF THE UTILITY'S CONSERVATION PLAN

Before a utility can implement a conservation plan, it must determine the goals of the plan and the needs which are being addressed. These factors will guide policy development and implementation.

Public water systems serve many needs of society and produce a variety of benefits. These include providing safe water for drinking purposes, abundant water for producing goods and services, irrigation water to beautify our public spaces and homes, water for outdoor recreational opportunities such as swimming pools and amusement parks, and water availability for fire protection. In the past, these benefits have been taken for granted with little regard for the impact of that water withdrawal on the environment. Often the very low cost for water in the past has led to its very inefficient use.

While satisfying the needs of water customers, we must be mindful of the sometimes severe impact that water supply withdrawal has on the environment. This often results in dewatering environmental habitats and drying up of nearby residential wells. The goal of an effective water conservation program should be to maintain the benefits cited above while not causing damage to the environment.

### WATER CONSERVATION CONCEPTS

There are at least three concepts that a utility can use in developing its strategy for water conservation. They are:

Require the installation of water conserving plumbing devices by customer.

Adopt billing policies that provide price incentives for conservation.

Develop educational programs to motivate users to conserve.

In many cases, the overall plan chosen by the water commissioners will have components representative of all three of these concepts. The advantages and disadvantages of each strategy are discussed briefly below.

**A Device Based Strategy. Installation of "add on" devices or replacement with new water fixtures that use water more efficiently.** Examples include water saving toilets or drip irrigation systems. The advantage of such a **device strategy** is that the water savings which are achieved, last forever. The drawback is that devices have an initial capital cost, which often can be high and requires the homeowner's participation. Entry into homes creates homeowner concerns and is inconvenient when all adults work during the day.

**A Price Incentive Strategy.** Where the price of water is generally low, water is undervalued relative to other basic costs, there is little expectation that excessive usage will be constrained by a low price or only a modest price increase. On the other hand, where water rates are relatively high, that rate, or an increase in the rate, is a substantial motivator to achieve conservation. In some situations the conservation achieved by higher water rates diminishes with the passage of time.

**An Educational Strategy. Educating the users to the importance of using water wisely.** Education actions can have little appreciable startup cost and thus can be easily instituted. The limitation however, is that without a continuing emphasis on education, which is staff intensive, the motivation to conserve often diminishes with time.

## **IMPLEMENTATION STRATEGY BY THE UTILITY**

### **Begin with Larger Users**

It is often wise to first identify all major water users served by the system and estimate the relative magnitude of use by each. The typical implementation strategy would be to focus on the larger users first. This could achieve the largest return for the initial staff time invested in the conservation program.

### **In-home Usage - Strategy for Achieving Reductions.**

Typical water use in a single family home is approximately 250 gallons per day (gpd) for a family of four persons. Toilet use and water used for personal hygiene are the largest in-home components. Historically, this use has accounted for approximately 40 percent of overall interior water use. Consumers typically find this is the easiest category within which to reduce water consumption. See DES fact sheet WD-WSEB-6-2 concerning customers conservation.

In 1991-92 the federal government took a major conservation step by requiring that all new toilets installed in the U.S. use not more than 1.6 gallons per flush. This is an approximate 50 percent reduction from the previous industry average.

### **Exterior Usage - Strategy for Achieving Reductions**

Exterior water use dramatically exceeds that of in-home use. A typical 4-6 gallons per minute (gpm) lawn sprinkler will use as much water in an hour as will be used otherwise within the home in an entire day. Since usage in this category is so high, even a slight reduction in outside water use typically exceeds the savings that could be expected from a substantial reduction in any "in-home" water use category. In addition, since exterior use occurs mostly during the summer, the benefits from conservation are achieved when the water resource is typically under the greatest withdrawal stress.

In water poor portions of the country, zoning and building codes specify the type of allowable landscaping so as to reduce exterior demand of exterior water use. The concept of drip irrigation probably holds the greatest promise of reducing outside water demand without creating a major negative impact. Other options include low-water tolerant shrubs and mineral based (colored crushed stone) landscaping.

### **SOME CAUTIONS CONCERNING CONSERVATION**

There are certain consequences of water conservation that need to be addressed as part of the overall implementation strategy. Some are noted below.

**Revenue Loss.** Since conservation reduces the volume of water used, successful conservation will reduce a water system's revenue. Consequently, water rates will need to be increased to maintain a balanced budget. Although the rate (dollars per 1,000 gallons) will increase, the overall amount of the water bill of an average customer that practices conservation should not increase because they now use less water. We suggest identifying this revenue consequence "up front" as part of the promotion of the water conservation program.

**Fixed Costs Remain.** Most water utilities have high fixed costs for example the building water storage tanks, installation of water mains, and developing new water supply sources. Generally, there is little cost saving realized when water production decreases other than a slight lowering of electrical and chemical costs.

**Loss of Resource Potential.** With a reduction in overall water use, the board of commissioners of a typical water system usually defers purchasing the rights to new water resource areas. With the passage of time many of these nearby, relatively low cost water resource sites will be developed and thus lost forever. Securing new water resource site(s) should be an integral part of a water conservation plan.

**Effectiveness of Water Conservation Plans.** Where wasteful use of water has been dramatically reduced by an active water conservation program, the future implementation of a summertime water ban should not be expected to achieve as much a response as was achieved in the past. Thus a utility must be more aware of the safe yield of its supplies under drought conditions and be most vigilant to ensure that supply capability always is substantially in excess of the customer's water demand.

### **LEAK DETECTION AND WATERSHED MANAGEMENT**

The water utility also has other major roles in a comprehensive water conservation plan. Those roles include a comprehensive leak detection program for the distribution system and carrying out proper watershed management to maximize the safe yield of all sources. An effective leak detection program and effective metering should achieve "unaccounted for water use" under 10 percent of total production. Utilities must set the right example in leak detection if they expect customers to follow.

### **FOR ADDITIONAL INFORMATION**

The DES has a number of more detailed documents which provide greater detail concerning a water conservation program. These documents are available for reference from the DES's Water Supply Engineering Bureau office at 29 Hazen Drive, Concord. These documents are from industry and other states. For a complete listing of all fact sheets please request WD-WSEB-15-2. Drinking water fact sheets are available through the DES web site at:

<http://www.des.state.nh.us> then select: publications, fact sheets, water division, water supply.

## WATER CONSERVATION REFERENCES

American Water Works  
Association  
6666 W. Quincy Ave .  
Denver, CO 80235  
1-303-794-7711

Northeast Rural Water Assoc.  
6 Prim Rd.  
P.O. Box 622  
Colchester, VT 05446  
1-802-660-4988

State of Arizona, Dept. of Environmental  
Quality  
3033 N. Central Ave  
Pheonix, AZ 85012  
1-602-207-2300

State of California  
Dept. of Health Services  
601 North 7th Street, PO Box 942732  
Sacramento, CA 94234-7320  
1-916-323-6111